

Testing is an Important Component in Achieving the DER Goals

How Can We Plan and Coordinate DER Tests?

Distributed Energy Resources - Challenges

Integration of DER into the Distribution System

Benefits

- Economy
- Market Relief
- Power Quality
- Reliability
- Emissions
- Gen. Capacity



2005



2010

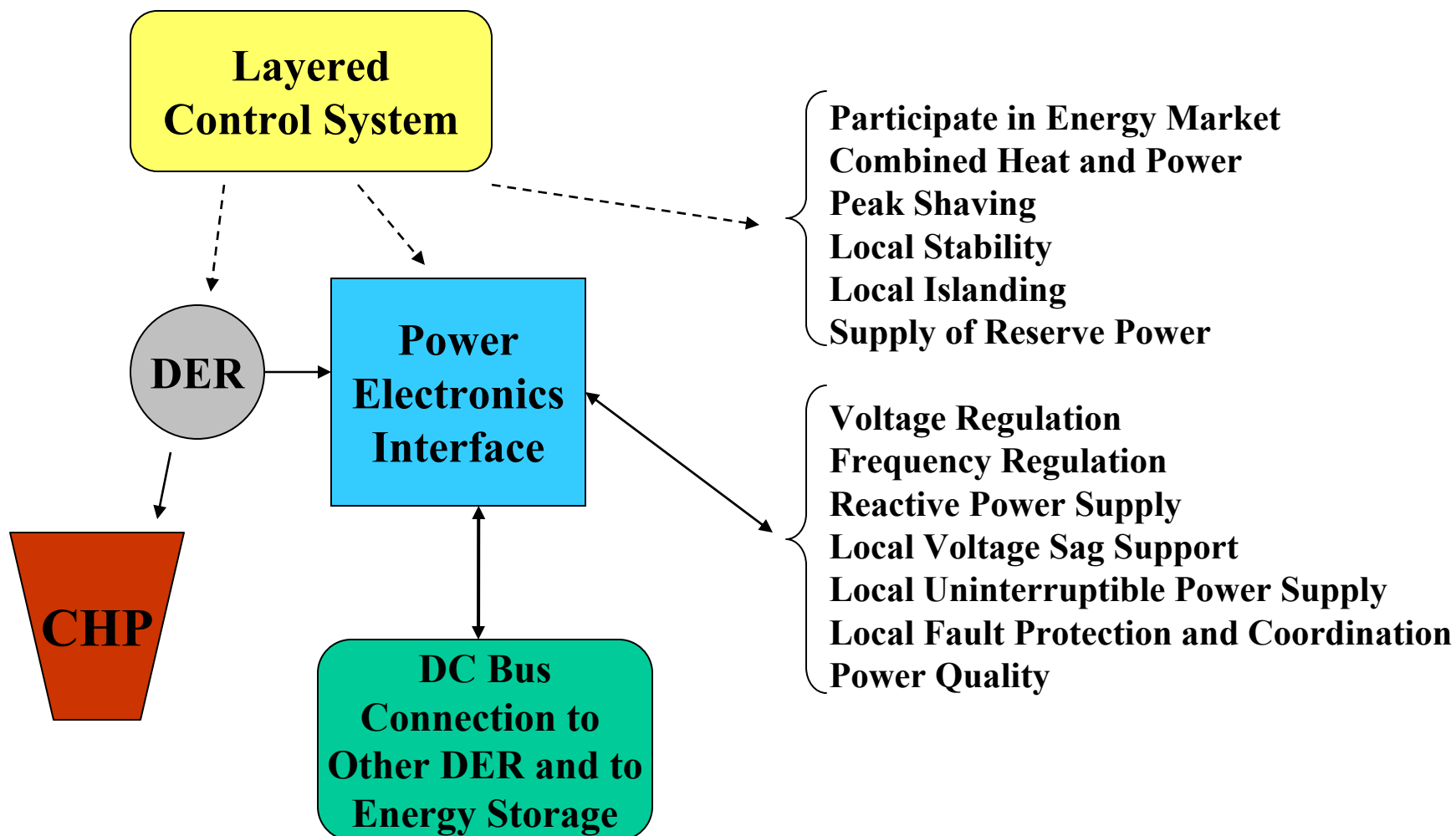
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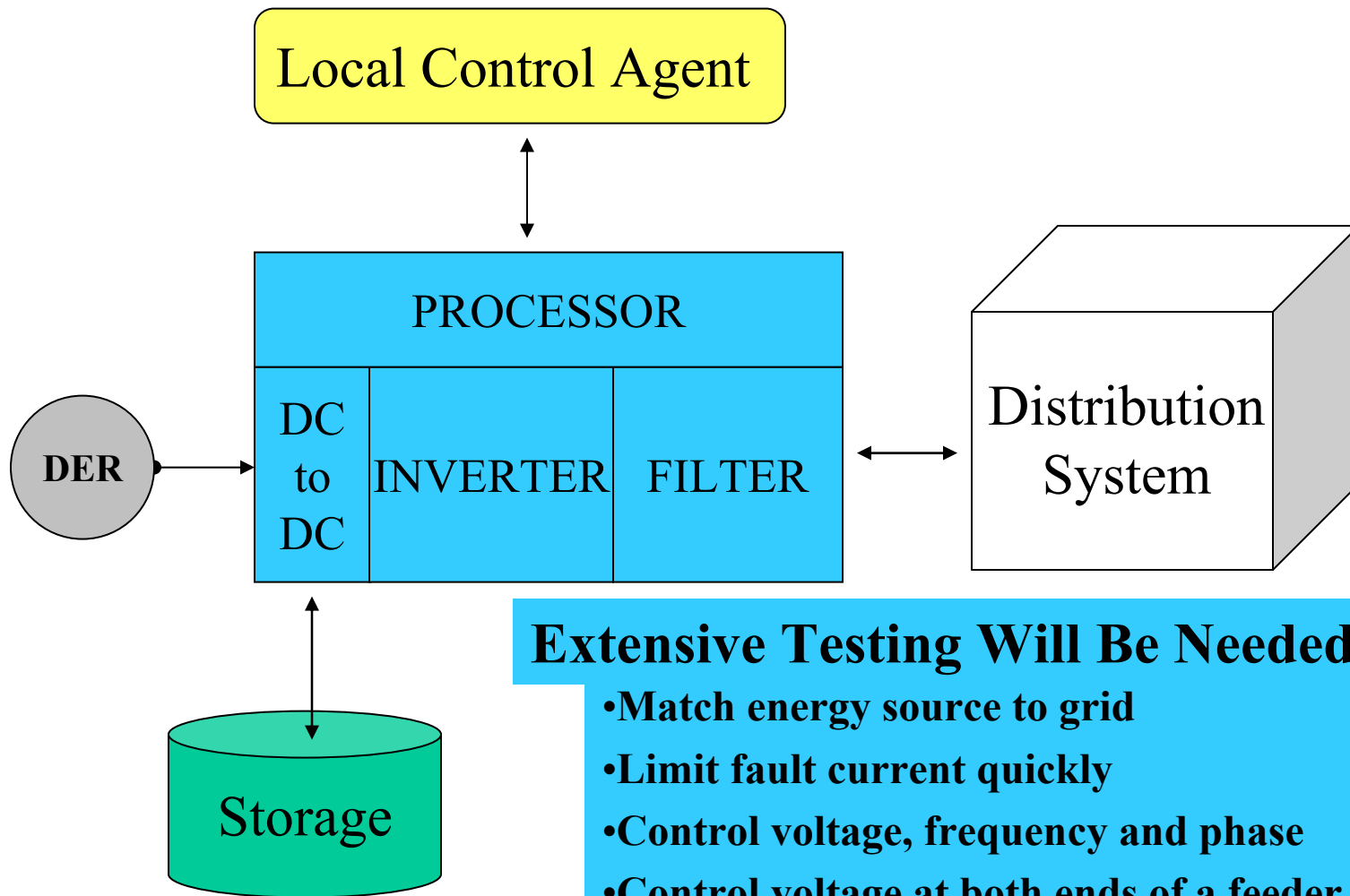
Barriers

- Interconnection
- Power Conditioning
- Architecture
- Sensors
- Communication
- Identifying customer

Vision of Possible Energy Delivery System



An Example of a Power Electronics Interface



Extensive Testing Will Be Needed

- Match energy source to grid
- Limit fault current quickly
- Control voltage, frequency and phase
- Control voltage at both ends of a feeder
- Incorporation of energy storage
- Safety

Near Term Challenges

Focus on User and Interface with the Utility

- Functionality
- Grid Compatibility
- Parallel with other DER
- Utility acceptance (Interconnection)
 - Disconnect from grid in outage
 - Incorporate into system protection
 - Power quality
- Emissions
- Economics
- Customer Information

Possible Longer Term Challenges

User Integration into the Local Utility System

- Services to the distribution system and grid
 - Significant generation on distribution systems
 - New emphases on local control authority, power electronics interfaces, etc.)
 - Significant benefits are possible
 - ✓ power quality
 - ✓ distribution and transmission capacity
 - ✓ overall fuel efficiency

Is Addressing the Needs and Gaps of Testing

- Survey of current test capabilities and plans
- Identification of areas which will be needed but are presently not covered
- Considering both near and long term
- Both the user side and utility side
- Planning for the future

Teamwork and Planning for Development and Testing

- DER Laboratory Network
- Federal, State and Industry partners
- Plan for the near term and long term
- Strive for consensus to fill in the gaps
- Consider infrastructure, energy delivery, institutional, and regulatory aspects of testing

- Significant involvement by manufacturers, users, and utilities
- Building Capabilities
- DER opportunities:
 - high reliability power for digital processes
 - generation capacity
 - other services
- Challenge: integrate with conventional systems
 - part of the solution, not part of the problem